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# Improving Air Quality Through Local Plans and Programs

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*A Guidebook for City and County Governments*

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Prepared by

The Association of Bay Area Governments

The Bay Area Air Quality Management District





### **An Invitation**

The Association of Bay Area Governments and the Bay Area Air Quality Management District extend this Guidebook to the cities and counties of the San Francisco Bay Area as an invitation to join in a partnership for clean air.

This Guidebook explains why local jurisdictions must be part of the air quality solution. It informs local policymakers and planners about air quality issues and opportunities relevant to local jurisdictions, and suggests key ideas for incorporating air quality-beneficial policies and programs in local planning and decision making.

A set of appendices to the Guidebook is also available to assist local planners in developing local air quality management strategies. The appendices provide essential background information and more detailed suggestions for improving air quality through local plans and programs.

For additional information or copies of the Guidebook or appendices, contact:

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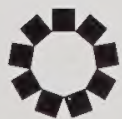


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*A Guidebook for City and County Governments*

April 1994



Association of  
Bay Area Governments



Bay Area Air Quality  
Management District

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## SUMMARY

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For over three decades, federal, state and regional agencies have been working together to clean the air. As a result of air pollution controls placed on industries and motor vehicles, air quality has improved dramatically in the San Francisco Bay Area. However, while the air is cleaner, some air quality standards continue to be violated. In addition, projected

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*Most air pollution is caused by automobiles.*

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growth could reverse some of the progress we have already made. More must be done to ensure that all Bay Area residents enjoy healthful air year-round. Planning programs that address the air quality impacts of growth can help us achieve that goal. The Bay Area Clean Air Plan (CAP) describes how each of us, regional agencies, local governments, businesses and individuals, can contribute to improving regional air quality. This Guidebook illustrates more specifically what cities and counties can do.

Since much of the region's air pollution can be traced to the growing use of cars, emphasis is placed on measures that decrease the number and length of auto trips. By changing the way we plan, develop and manage our communities, we can reduce auto dependence and motivate residents to use transit, bicycle or walk to some of their daily destinations. Over time, with participation from cities and counties throughout the region, these measures will add up to cleaner, healthier air.

Many of the recommended measures will produce additional desirable benefits. For example, reducing the

number of cars on Bay Area roadways will improve traffic flow, conserve energy and reduce the contamination of roadway runoff that pollutes the Bay and other waterways. Providing sidewalks and bicycle pathways between neighborhoods and nearby schools, recreation centers and commercial districts can put neighbors in touch with one another and build a stronger sense of community. Focusing new development in compact patterns within existing cities will preserve open space and save money on maintenance of roads and on other services.

The Guidebook is designed for easy use. Local policy and implementation ideas are presented in a checklist format. Planners and decision makers can review current practices and determine the best way to address their community's needs. More detailed descriptions of local planning measures, sample site design guidelines, and background information, including air quality profiles for Bay Area subregions, are provided in a supplementary set of appendices.

The Association of Bay Area Governments (ABAG) and the Bay Area Air Quality Management District (Air District) invite cities and counties to join us in a partnership for clean air. Whether amending a general plan, reviewing a subdivision or development proposal, redeveloping a downtown area or preparing a capital improvements budget, measures to improve air quality should be part of the process.



# AIR QUALITY ISSUES AND OPPORTUNITIES

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## **Local Government Needs to be Involved**

Air pollution is, to a large extent, a regional problem. Pollutants generated in one community frequently drift to cause air quality problems in other areas within and even outside the region. This is why a nine-county Air District was instituted in the San Francisco Bay Area and why the joint efforts of regional agencies have guided air quality planning.

Air pollution controls on industries and automobile exhaust have dramatically improved the region's air quality. However, the Bay Area has achieved most of the benefits these measures can produce. To continue to reduce air pollution, the leadership of local officials, exercising land use authority through local programs, is needed now.

Some air pollution problems are localized, limited to a construction site, a particular road intersection or a few blocks within one community. These types of local air quality problems, as well as the regional pollution related to the growing use of cars, can be addressed effectively by local governments. The cumulative effect of local actions can significantly improve air quality.

## **Land Use, Transportation & Air Quality are Connected**

Motor vehicles are a major source of carbon monoxide, fine particulates, pollutants that combine to form ground-level ozone, and toxic air contaminants such as benzene. In order to meet and maintain state and national standards for these pollutants, we have to persuade Bay Area residents to drive

less. To do that we must change the way we plan, develop and manage our communities to make it easier and more attractive for residents to use transit, bicycle or walk.

Land use patterns directly affect how we travel from our homes to work, school and other destinations. When homes are separated from job sites, schools, parks, shops and services, residents are more likely to use motor vehicles for their daily trips. This includes buying groceries, renting a video, or taking the kids to school. If homes are too far apart to support frequent, convenient transit, cars will be the vehicles of choice.

Cities and counties control the comprehensive planning and development process. As members of transportation authorities and congestion management agencies, local jurisdictions also work together to coordinate land use and transportation programs. The general plans, congestion management programs and implementation measures they adopt can and should reflect a commitment to clean air.

For example, to reduce car use, local jurisdictions can require that schools and shops be located in residential neighborhoods; shops and services be convenient to employment centers; and sidewalks, bicycle paths and transit link them all. Entrances to offices and shops can be located close to sidewalks and transit stops with parking moved behind buildings and shopping centers. Cities can focus development in compact patterns along transit routes, and locate higher concentrations of homes, shops, and job

*For more information about encouraging alternatives to the automobile in local planning and decisionmaking, see Appendices E and F.*



sites near bus and train stations. A group of cities can work together to improve transit networks.

Cities and counties can address air quality concerns in a number of other ways. To protect the most sensitive residents from accidental toxic emissions, localities can assure that child care centers, schools, senior centers and hospitals are sited at appropriate distances from factories, landfills, refineries and similar uses. They can require that builders control dust and other pollutants generated by construction activity. Although the strategies will differ based on size, location and local characteristics, every community can contribute to cleaner, healthier air.

#### **Recommended Measures Have Other Benefits**

In addition to improving local and regional air quality, many of the recommended measures can help Bay Area cities and counties address a variety of other issues. Air quality-sensitive planning strategies can help localities achieve the following benefits:

- ▲ reduce traffic congestion
- ▲ increase mobility
- ▲ conserve energy
- ▲ improve water quality
- ▲ preserve open space, agriculture, and other land resources
- ▲ use infrastructure and land more efficiently
- ▲ reduce roadway construction and maintenance costs
- ▲ develop more cohesive communities

For more information about other benefits of recommended measures, see Appendix H.

Land use and transportation strategies that offer residents alternatives to long daily commutes by car are particularly beneficial. Measures that make it pleasant and convenient to walk, bike or take transit to shops, schools and services have similar and complementary effects.

#### **Air Pollution Has Serious Effects**

Chronic exposure to air pollutants represents a serious health risk to millions of Bay Area residents, particularly the young, the elderly, and people with heart disease and respiratory problems. But even the healthiest among us can experience coughing, eye irritation, shortness of breath, headaches and other health problems caused by polluted air. Safeguarding public health has been the primary focus of federal and state air quality legislation and the Air District's planning and regulatory activities for over thirty years.

Local air quality problems affect far more than health, however. Air pollution impacts the local economy by damaging agricultural crops and plants, as well as buildings and exposed materials. Certain pollutants impair visibility and obscure our magnificent views. Pollution generated in the Bay Area can drift and contribute to unhealthy air in adjoining regions. Air contaminants also add to broader environmental problems such as acid precipitation, global warming and depletion of beneficial stratospheric ozone.

The following table describes the principal sources and summarizes the effects of three pollutants responsible for many of the Bay Area's most serious air pollution problems: ground-level ozone, carbon monoxide and fine particulate matter of 10 microns or less (PM<sub>10</sub>).



## Three Key Air Pollutants Harm Health, Environment and Property

*These "Criteria Air Contaminants" have exceeded ambient air quality standards in the Bay Area in recent years.*

Pollutant	Source	Health Effects	Environmental Effects	Property Damage
<b>ozone</b> (O <sub>3</sub> ) ground-level ozone is the principal component of smog	photochemical reaction of reactive organic gases (ROGs) and nitrogen oxides (NO <sub>x</sub> ) in the presence of sunlight; approximately half of the ROGs and NO <sub>x</sub> is from motor vehicle emissions	aggravates respiratory diseases; irritates eyes; speeds aging of lung tissue; some ROGs can cause cancer and other diseases	damages plants, trees; NO <sub>2</sub> can reduce visibility	damages rubber, fabrics, building materials
<b>carbon monoxide</b> (CO)	65-85% from motor vehicles; woodstoves and fireplaces also contribute	reduces ability of blood to circulate oxygen; can exacerbate circulatory and respiratory problems; can cause death at high concentrations		
<b>fine particulate matter</b> (PM <sub>10</sub> ) dust, smoke, soot	motor vehicle sources: dust resuspended from paved and unpaved roads and parking lots; gasoline and diesel engine exhaust; woodburning; industrial and agricultural processes; grading and construction	damages lungs; irritates nose and throat; causes bronchitis and increased morbidity	creates visibility-reducing haze	dirtyes and discolors structures, fabrics, vegetation

"Criteria air contaminants" are pollutants for which ambient air quality standards have been set to protect public health and welfare. National standards are set by the U.S. Environmental Protection Agency and state standards are set by the California Air Resources Board in consultation with the California Department of Health Services. Additional criteria contaminants are sulfur oxides, nitrogen oxides, and lead. These contaminants are not included in this table because the standards for these pollutants have not been violated in the Bay Area since the 1970s.

*For more information on individual contaminants and their effects, see Appendix A.*



## **Air Quality Standards are Set to Protect People**

National and state standards have been established for the six most prevalent air pollutants – called the criteria contaminants – ozone, carbon monoxide, fine particulate matter, sulfur dioxide, oxides of nitrogen, and lead. Standards are set at levels meant to protect the health of sensitive members of the public, such as children whose lungs are still developing, the elderly whose immune systems are weakened, people with heart or lung problems, and even healthy adults who breathe large volumes of air during strenuous work and sports activities.

Several California standards, including those for ozone and fine particulate matter, are more stringent than the corresponding national standards and thereby provide greater margins of safety for protecting public health.

*For more information about  
air quality standards,  
see Appendix B.*

## **Air Quality Management: Historical & Recent Approaches**

During the last 30 years, the state and federal governments have established health-based air quality standards and directed metropolitan areas to meet them. They have also required specific mobile source controls, such as motor vehicle emissions standards and vehicle inspection and maintenance programs. The cars we drive, the fuels we use and the air we breathe are cleaner as a result of these efforts.

Much of the responsibility for meeting state and national air quality standards has been delegated to the Air District. Air District regulatory actions have achieved significant reductions in criteria air contaminants as well as toxic emissions from factories, landfills, agricultural burning, gas stations, dry cleaners and other stationary sources. In addi-

*For more information about air  
quality laws and programs,  
see Appendix B.*

tion, reductions have been achieved through changes in the formulation and use of “area” pollution sources such as paints and varnishes. To address pollution caused by motor vehicle use, the Air District has adopted an employer-based trip reduction regulation.

These and other controls have brought about substantial reductions in air pollution. However, most of the technologically and economically feasible industrial, area and mobile source control measures have already been adopted. Additional improvements will require a new, broader-based approach. The active participation of every city and all nine counties will be needed to achieve the region’s air quality goals. The table on the next page illustrates the role that various public agencies should play in improving air quality.

## **Bay Area Air Quality Needs to Improve**

Despite great improvements in the past 30 years, the San Francisco Bay Area still experiences unacceptably high air pollution levels on some days. The Bay Area has been designated a nonattainment area for several national and state health-based air quality standards, including standards for carbon monoxide, ozone and fine particulate matter.

Bay Area ozone and carbon monoxide measurements, in the years immediately preceding 1994, indicate that the region has attained the national ozone standard and the national and state carbon monoxide standards. However, during the same period the more stringent California ozone standard has been violated about twenty times each year, usually on hot days in inland areas. Even though all moni-



## Federal, State, Regional and Local Responsibilities for Improving Air Quality

Action	U.S. EPA	ARB*	Air District	ABAG/MTC*	City/County
Establish air quality standards and planning requirements	▲	▲			
Prepare regional air quality plans			▲	▲	
Monitor air pollutant levels			▲		
Compile emissions inventory			▲		
Identify air quality problems			▲		▲
Adopt general plan policies and programs					▲
Implement programs to reduce emissions	▲	▲	▲	▲	▲

\*ARB is the California Air Resources Board, MTC is the Metropolitan Transportation Commission

toring stations record attainment of the carbon monoxide standards, the region must continue to maintain the standards. Maintaining CO standards will be especially challenging for communities with increasing traffic congestion.

State standards for PM<sub>10</sub> are exceeded everywhere in the Bay Area, and projections indicate that PM<sub>10</sub> emissions may be on the rise. This is particularly troubling since particulates represent such a serious health hazard.

The Bay Area can be proud of its air quality accomplishments. However, the region must continue to reduce air pollution in order to meet the more stringent state standard for ozone and the national and state standards for PM<sub>10</sub>.

### Air Quality Challenges: Ozone, Carbon Monoxide & PM<sub>10</sub>

The health and other effects of ozone and carbon monoxide have been well documented and publicized over the years. Both pollutants can cause or exacerbate respiratory ailments. But recent studies have focused more attention on the health effects of PM<sub>10</sub>.

Not only has PM<sub>10</sub> been shown to worsen chronic conditions such as bronchitis, asthma and children's respiratory illnesses, studies in a number of cities have shown correlations between particulate levels and emergency room visits, hospital admissions and deaths.

Motor vehicles currently constitute the single largest source of ozone precursor, carbon monoxide and



PM<sub>10</sub> emissions in the Bay Area. Moreover, the proportion of PM<sub>10</sub> emissions attributable to motor vehicles, currently about 50 percent, may be increasing. Local measures that make it more attractive and practical for residents to walk, bicycle or use transit for some of their daily trips can significantly improve both local and regional air quality.

Woodsmoke from woodstoves and fireplaces is another significant PM<sub>10</sub> source. On cold, windless winter nights, as much as 40 percent of the fine particulates in the air can be related to woodburning.

Cities and counties can address woodsmoke-related particulates in a variety of ways. An important first step is to educate the community about the hazards of woodburning and encourage cooperation with efforts such as the Air District's "Don't Light Tonight" program. Other measures include encouraging residents to replace or retrofit their woodburning fireplaces and stoves with units that minimize PM<sub>10</sub> emissions. Localities can also change building codes to ensure that only the cleanest fireplaces, for example gas-fired units, are installed in new homes.

### **Regional Plan Guides Air Quality Efforts**

Both the state and federal governments require every non-attainment region in California to produce a plan describing

what it will do to achieve and maintain clean, healthy air. In the Bay Area, the Air District develops air quality plans with cooperation and technical support from ABAG and MTC. Required components include air quality monitoring

data, emissions sources and inventories, land use and transportation measures, controls on industries and other direct sources of air pollution, and controls on area sources such as paints and varnishes.

The Bay Area Clean Air Plan (CAP) is the Bay Area's "blueprint" for cleaner air. Designed to make progress toward attainment of the stringent state standards, the CAP spells out what regional agencies, cities and counties, industry, businesses and individual citizens can do to improve the air. Strategies contained in the plan will reduce carbon monoxide, ozone

and PM<sub>10</sub>.

A primary goal of the CAP is to reduce the number of trips and vehicle miles Bay Area residents travel in single-occupant vehicles. The CAP includes a variety of transportation control measures (TCMs) designed to achieve this goal. TCMs intended to improve alternatives to driving alone include expanding rail, bus and ferry services, improving carpooling facilities, and providing bicycle lanes and sidewalks. The CAP TCMs also aim to reduce the demand for single-occupant vehicle travel. Demand management strate-



For more information on air quality problems and trends, see Appendix C.



gies include “market-based” TCMs, which seek to make the price of driving a vehicle more accurately reflect true costs.

The CAP includes local land use measures as an essential complement to transit, carpooling and bicycle improvements. Land use patterns and site designs that encourage walking, biking, carpooling and transit use are needed to make effective use of these transportation options. Accordingly, the CAP encourages local jurisdictions to adopt land use, transportation, housing, employment, and other programs that would allow and encourage residents and employees to use less polluting transportation alternatives.

### **Local Plans and Programs Are Key**

The CAP encourages all cities and counties to address air quality issues in their general plans. This recommendation recognizes that the general plan is the foundation upon which all local planning and development policies and programs are built. Whether communities develop a separate air quality element, as some Bay Area jurisdictions have done, or integrate air quality throughout the other elements of the general plan, consistency and implementation are essential.

California planning law requires that local policies and programs demonstrate consistency on several levels. First, all of the elements of the local general plan, including

an optional air quality element or section, must be consistent with one another. Second, policies in local general plans should be consistent with the plans and policies of regional, state and federal agencies. Finally, local implementation pro-

grams must be consistent with and support the general plan.

Implementation programs shape a community’s day-to-day activities. To consistently address air quality in all local planning and decision-making, local jurisdictions should adopt air quality-sensitive implementation programs. Subdivision and zoning ordinances, congestion management programs, environmental review procedures, mitigation monitoring programs, capital improvement programs, transportation plans and projects, site design guidelines and construction practices – all should reflect a

commitment to clean air.

### **Air Quality and Other Goals May Conflict**

Some air quality objectives have the potential to conflict with other community goals. For example, widening roads to reduce congestion may provide relief in the short run, but may lead to increased traffic and air pollution in the long run. Even individual measures aimed directly at improving air quality can produce conflicting results. For example, adding housing in a job-rich community may reduce vehi-





cle trips, but would not be appropriate if the project site is located near a landfill, sewage treatment plant, or other odor-producing land use. As with any such conflict, all reasonable alternatives should be considered, with recommendations and decisions guided by concern for the health, safety and welfare of the general public.

### **Subregional Cooperation is Essential**

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Cooperation is vital  
for the success of air  
quality plans.

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Air pollutants do not respect political boundaries. An activity in a city or county with relatively clean air may be a source of pollution for communities downwind. Thus, all cities and counties should strive to reduce emissions for the health and welfare of their own residents as well as those of neighboring communities.

Most local governments acting independently can reduce auto use and increase the viability of transportation alternatives. Local governments' ability to improve air quality can be greatly enhanced by coordinating land use and circulation policies with neighboring communities. Congestion management agencies, countywide planning and development agencies, transportation authorities and similar organizations offer opportunities for local jurisdictions to work together to develop and promote effective air quality strategies.

### **Soliciting Public Input**

The success of local air quality strategies will depend in large measure on how well they are embraced by Bay Area residents. Cities and counties can build a strong foundation

for cooperation by educating citizens about the causes and effects of air pollution, and inviting them to participate in air quality-sensitive policy and program development. Local jurisdictions developing air quality management strategies should seek input early in the decision-making process from local citizens and organizations as well as from public agencies of neighboring communities.

### **Using This Guidebook**

Local action to improve air quality is the primary focus of this Guidebook. General plan policy ideas are listed in a checklist format so that policymakers and planners can review current policies and programs, identify air-quality-sensitive actions they have implemented and consider others they may be able to take. Each policy is accompanied by a sample implementation measure. The policy checklist is followed by more complete listings of implementation programs, subdivided into categories for easy reference. More extensive background and technical information can be found in the accompanying volume of appendices.



# SUGGESTED LOCAL POLICIES AND PROGRAMS

## Identifying Air Quality Strategies

To assist local planners and policymakers in identifying and evaluating air quality policies and programs suitable for their general plans, ordinances, and related implementing programs, this section suggests key action-oriented policy and program ideas.

Since air quality and other characteristics vary greatly among Bay Area cities and counties, a range of approaches to local air quality planning is provided. Each jurisdiction can select the measures that are appropriate to its needs. The policies and programs highlighted in this section are presented in a checklist format to help planners and

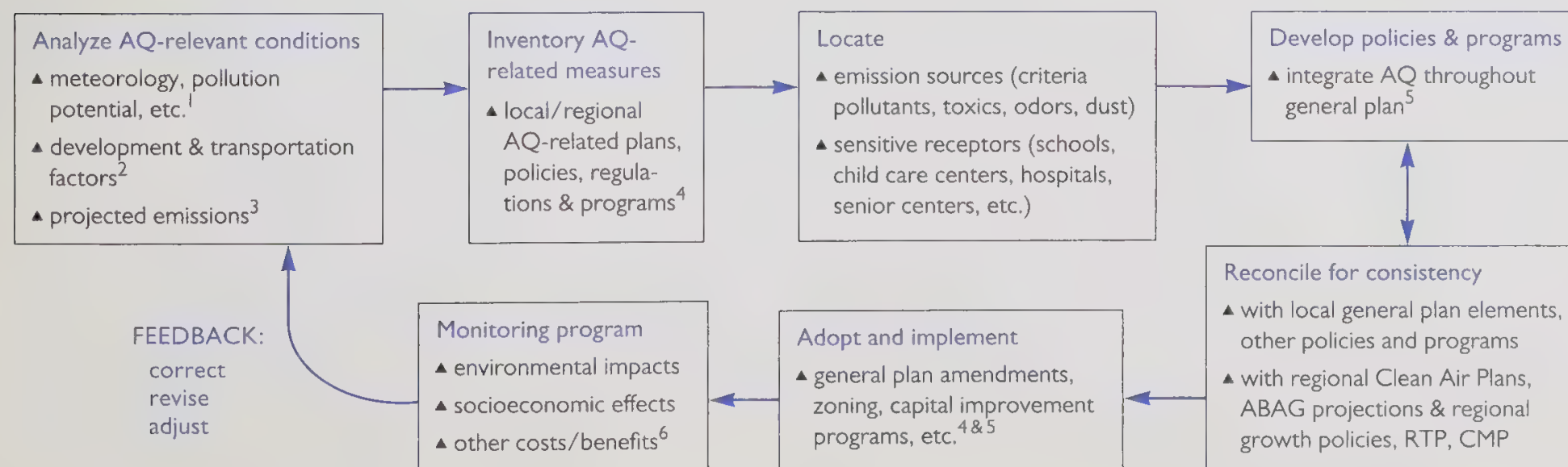
policymakers quickly assess current programs and practices, determine how they might update local general plans and implementing programs, and recognize that measures to improve air quality can and should be incorporated into all local activities.

## Air Quality Planning Process

Air quality planning closely parallels the general planning process. Like other specialties, however, it has some special requirements. To orient local planners and policymakers to the process, this flow chart shows the basic procedures and the essential components of air quality planning.

For more detailed information about the air quality planning process, see Appendix G.

## Procedures for Addressing Air Quality (AQ) in Local Plans, Policies & Programs



For detailed information about these air quality procedures and their components, see the appropriate section:

<sup>1</sup> Appendix D.

<sup>2</sup> Appendices E and G.

<sup>3</sup> Appendix C.

<sup>4</sup> Checklist, starting on p. 14.

<sup>5</sup> Appendices E, F, G.

<sup>6</sup> Appendix H.



Developing An Air Quality Program For Your Community

Every city and county in the Bay Area has a unique combination of characteristics that affect air quality. Therefore, air quality problems and the strategies developed to address them will vary. Even within the same community, the air quality policies and programs implemented in a residential

neighborhood may differ from those that apply in a commercial district or an office park. Air quality-relevant factors include size, density, community type, development potential, land use, transit accessibility and geographic location. This table highlights measures that three different communities might find most effective.

For a table of community-specific measures with significant air quality benefits, see Appendix E.

What You Can Do Locally to Improve Air Quality

In suburban communities with minimal growth potential & limited transit service:	In rural, outlying communities with minimal infrastructure improvements:	In diverse, growing or redeveloping communities with a range of transit and infrastructure improvements:
<ul style="list-style-type: none"><li>Promote a mix of land uses that locates neighborhood services within walking distance of existing residences.</li><li>Fund pedestrian-, bicycle-, and transit-oriented improvements in conjunction with periodic road and maintenance projects in existing neighborhoods.</li><li>Coordinate with neighboring jurisdictions to establish paratransit, shuttles, and expanded transit service.</li></ul>	<ul style="list-style-type: none"><li>Establish an urban growth boundary and only approve new development inside the boundary and agriculture/open space uses outside the boundary.</li><li>Adopt dust control measures and establish buffer zones between agricultural and residential uses to protect residents from dust, air pollutants, &amp; other agricultural impacts.</li><li>Fund bicycle- and pedestrian-oriented improvements in conjunction with periodic road and maintenance projects in existing neighborhoods.</li></ul>	<ul style="list-style-type: none"><li>Promote residential infill development in areas adjacent to office or commercial land uses, in areas served by public transit, and in areas that have an existing complement of commercial services, neighborhood amenities, and jobs.</li><li>Require pedestrian-, bicycle-, and transit-oriented features in development projects; consider auto-free zones.</li><li>Adopt parking strategies and other transportation demand management measures to minimize the number of trips and vehicle miles traveled locally and on regional roadways.</li></ul>



## Using the Policy and Program Checklist

Much of the region's air pollution can be traced to the use of cars. For this reason, many of the suggested policies and programs are land use and transportation measures aimed at reducing the number and length of auto trips. However, the checklist also highlights energy conservation, recycling and other measures that can contribute to cleaner air.

The checklist is divided into three sections. The first section offers examples of air quality-related land use, housing, transportation, conservation, open space, and other policies local agencies should consider incorporating into their general plans. For each policy, the checklist identifies an implementation program example, such as zoning ordinance measures, transportation control measures, conditions of project approval, project EIR contents, and development review procedures.

The first section of the checklist can be used as a draft scope of work for amending the local general plan to include the range of air quality planning techniques available to local agencies. The format enables planners to identify policies and programs that already are in their general plans, as well as those which should be considered.

Air quality policies can be included in a separate general plan element or added to an existing element (e.g. land use, housing, circulation, conservation). Whatever method is selected, planners should integrate compatible policies throughout the general plan to ensure internal consistency. The first section of the checklist is organized by general plan element to help local planners achieve this goal.

The second section of the checklist offers implementation programs that cities and counties can adopt to incorporate air quality into local regulatory and other procedures. Examples are provided for amending local zoning ordinances, capital improvement programs, subdivision ordinances, CEQA review procedures, redevelopment programs, and community design standards.

The third section of the checklist identifies additional implementation measures local agencies can consider, including economic development programs, energy conservation and recycling programs, building and housing codes, LAFCO procedures, subregional planning activities, growth management, congestion management, monitoring programs, business licenses, dust control measures, and demonstration projects.

Many cities already employ several of these recommendations in some fashion. The policy language and implementation programs in all three sections are generic. The checklist is intended to provide a range of techniques and should be edited to suit local conditions.


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Use the following pages  
to select appropriate  
air quality measures.

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*For more detailed information  
about local policies and programs,  
see Appendix E.*



 INSTRUCTIONS: Use the checklist on these next six pages to identify key air quality policy and program options. Mark the appropriate box in the right-hand column and then refer to this worksheet when you are making policy, program and planning decisions.

## Section I: Options for Addressing Air Quality in General Plans

General Plan Policy/Program	Example of Implementation	Already in GP	Will Amend	n/a
<b>Land Use Policy Options</b>				
Establish an urban growth boundary and only approve urban development inside the boundary and open space uses outside the boundary.	Amend land use map and zoning ordinance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participate with neighboring jurisdictions in subregional planning activities to improve air quality.	Share information, jointly adopt policies, cooperate to establish/meet performance standards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Require pedestrian-, bicycle-, and transit-oriented features in new development projects.	Adopt relevant site design guidelines (See Appendix F).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encourage compact development featuring a mix of uses that locates residences near jobs and services.	Zone higher densities near downtown and other activity centers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promote infill development in areas where higher-density housing already exists, in areas adjacent to commercial or industrial land uses, and in areas served by public transit.	Provide density bonuses, fee waivers, and infrastructure; streamline approval processes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incorporate the provisions of the Air District's <i>Air Quality and Urban Development: Guidelines For Assessing Impacts of Projects and Plans</i> into project review procedures.	Incorporate implementation measures contained in Guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Locate new air pollution point sources such as manufacturing and extracting facilities at appropriate distances away from residential areas & facilities that serve sensitive receptors.	Amend land use map and zoning ordinance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Require developments that generate high numbers of vehicle trips, such as shopping malls and business parks, to incorporate air quality mitigations in their designs.	Adopt indirect source guidelines.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Include buffer zones within new residential and sensitive receptor site plans to separate those uses from freeways, arterials, point sources and hazardous material locations.	Require as condition of approval.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Housing Policy Options</b>				
Promote an approximate balance between jobs and housing and a range of housing types reflecting the income distribution of the local employment base.	Amend land use map and zoning ordinance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop incentives to encourage a range of housing unit types, densities, and prices.	Offer density bonuses; adopt inclusionary zoning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Facilitate the development of higher density housing and employment centers near existing and proposed transit stations.	Amend land use map and zoning ordinance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



General Plan Policy/Program	Example of Implementation	Already in GP	Will Amend	n/a
Strive to meet regional fair-share housing objectives for all income categories to minimize in-commuting.	Offer density bonuses; streamline approval process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase maximum allowable densities and require residential projects within high-density residential designations to achieve an appropriate minimum density.	Amend land use map and zoning ordinance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Transportation Policy Options</b>				
Minimize the total number of vehicle trips and vehicle miles travelled (VMT) throughout the planning area.	Adopt transportation demand management (TDM) ordinance/measures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minimize the number of vehicle trips during peak hours.	Adopt TDM measures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Support investment in transit as an alternative to automobile-intensive transportation improvements.	Include in congestion management program (CMP).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Require new developments to incorporate facilities and establish programs that manage transportation demand.	Require as condition of approval.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control availability of parking spaces for single occupant vehicles in new and/or redeveloping commercial and employment generating land uses.	Establish parking caps; reduce parking requirements as an incentive.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accommodate alternate modes of transportation by providing transit-compatible streets and circulation patterns.	Amend subdivision ordinances, design guidelines, redevelopment guidelines.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Create and maintain a safe and convenient bicycle and pedestrian system that links residential, commercial, and recreational uses and encourages walking instead of driving.	Require new and redeveloping projects to provide pedestrian and bicycle facilities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Conservation and Open Space Policy Options</b>				
Approve only open space, park, recreational, agricultural, and other low-intensity uses outside the urban growth boundary.	Amend land use map and zoning ordinance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plant street trees and landscaping to shade pedestrians and reduce energy demand for cooling.	Develop public tree planting program; adopt landscape guidelines for private projects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Require energy conservation and waste management features citywide and in specific developments.	Require shade trees in site design, establish recycling program.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complete a continuous public open space system surrounding the planning area.	Establish a land trust to acquire fee title and easements; allow transfer of development rights.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Other Air Quality Policy Options</b>				
Meet national and state air quality standards for air pollutants of local concern.	Include standards in general plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coordinate air quality planning efforts with other local, regional and state agencies.	Share information, cooperate to meet standards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



General Plan Policy/Program	Example of Implementation	Already in GP	Will Amend	n/a
Support the Bay Area Air Quality Management District in monitoring air pollutants of concern on a continuous basis.	Publish regional air monitoring results in plans (Appendix C).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Require new development projects to include traffic and air pollutant reduction measures to help attain air quality standards.	Require as condition of approval – see transportation measures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evaluate hazardous air pollutant emissions in development review procedures of proposed land uses that may handle, store or transport lead, mercury, vinyl chloride, benzene, asbestos, beryllium, and other hazardous materials.	Include hazards specialist in local development review.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduce PM <sub>10</sub> emissions from fireplaces and wood stoves.	Allow only clean-burning fireplaces and wood stoves in new homes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Establish emission controls for chlorofluorocarbons (CFCs).	Prohibit use of high-CFC-emitting products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Section 2: Typical Implementation Programs for Addressing Air Quality

Implementation Program	Example	Already Doing	Will Do	n/a
<b>Zoning Ordinance</b>				
Amend the zoning ordinance to include trip reduction and transit oriented development (TOD) features.	Allow mixed uses and require minimum densities in zoning districts near commercial centers and transit stations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amend the zoning ordinance to reflect an urban growth boundary.	Amend the zoning map to locate urban use districts inside the boundary and open space districts outside the boundary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amend the zoning ordinance to promote infill development where higher-density housing exists, in areas adjacent to commercial or industrial land uses, and in areas served by public transit.	Provide density bonuses in high-density residential and major commercial zoning districts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amend the zoning ordinance to restrict new air pollution point sources, such as manufacturing and extracting facilities, near residential areas and facilities serving sensitive receptors, and new housing near existing air pollution point sources.	Delete manufacturing and extracting as permitted uses near facilities that serve sensitive receptors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amend the zoning ordinance to provide a range of housing types and densities.	Require affordable housing in residential districts ("inclusionary zoning").	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Implementation Program	Example	Already Doing	Will Do	n/a
Amend the zoning ordinance to require high-density housing near existing or proposed transit stations and along transit corridors.	Amend the zoning map to locate high-density residential zoning districts near transit stations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amend the zoning ordinance to encourage compact development featuring a mix of uses that locate residences near jobs and services.	Allow higher-density mixed uses near downtown areas and transit stations; allow telecommuting in residential districts; remove unnecessary restrictions on home occupations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Capital Improvement Programs</b>				
Fund pedestrian-, bicycle-, and transit-oriented improvements in conjunction with periodic road improvement and maintenance projects.	Acquire abandoned rights-of-way and make improvements for trails that link activity centers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fund a shuttle bus or other form of transit to connect existing neighborhoods with light rail or BART/CalTrain stations.	Purchase a bus or van and have local transit agency provide drivers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Subdivision Ordinance</b>				
Amend the subdivision ordinance to include trip reduction and TOD features.	Cluster residential lots near commercial centers and transit stations; provide pathways linking residential, commercial, and employment uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>CEQA Review</b>				
Include air quality in mitigation monitoring programs.	Monitor trip reduction results annually.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ensure that local EIRs address the cumulative impact of proposed projects and their potential effects on air quality conditions.	Include in CEQA Guidelines and EIR scopes of work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incorporate the provisions of the Air District's <i>Air Quality and Urban Development: Guidelines For Assessing Impacts of Projects and Plans</i> into CEQA project review procedures.	Incorporate implementation measures contained in Guidelines.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notify adjacent cities and the Air District of proposed projects which may significantly affect air quality.	Refer project EIRs and plans to adjacent cities and the Air District.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Redevelopment</b>				
Include affordable housing in redevelopment plans for higher-density and mixed use development.	Use 20% housing set-aside from tax increments for affordable housing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Include higher-density residential projects and mixed use development near transit stations and in infill areas.	Require residential densities high enough to support transit- & pedestrian-oriented uses (15+ units/acre).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Establish redevelopment areas along abandoned rights-of-way and near planned transit stations.	Acquire transportation rights-of-way for mixed use development in downtown and redeveloped areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Implementation Program	Example	Already Doing	Will Do	n/a
<b>Community Design Standards</b>				
Adopt community design guidelines that discourage automobile use and encourage energy conservation.	Require direct and convenient routes for pedestrian travel connecting major activity centers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Provide curb cuts for bicycles where bike paths cross streets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Locate bus pullouts near downtown areas, schools, commercial centers, job sites, and high-density residential areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Encourage new developments to include street grids that provide multiple routes to major destinations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Section 3: Other Implementation Programs for Addressing Air Quality

<b>Economic Development</b>				
Recruit low- or non-polluting industries for economic restructuring and job training programs.	Recruit R&D, office, and non-manufacturing industries.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encourage employers to hire new workers from within the community.	Establish job re-training program; provide incentives to employers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Energy Conservation and Recycling Programs</b>				
Adopt an energy conservation ordinance and a recycling ordinance.	Establish minimum energy consumption standards; adopt curbside and other recycling programs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Building and Housing Codes</b>				
Minimize installation of woodburning fireplaces and stoves and allow only gas-fired or other clean-fuel burning appliances in residential, commercial, and industrial buildings.	Amend building and housing codes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>LAFCO</b>				
Work with Local Agency Formation Commission (LAFCO) to establish urban growth boundaries and encourage other growth management techniques.	Include as a part of annexation and sphere-of-influence applications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Subregional Planning</b>				
Cooperate with other cities on projects which strengthen trip and pollution reduction activities.	Coordinate inter-city pedestrian and bicycle trails, transit-oriented projects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Implementation Program	Example	Already Doing	Will Do	n/a
<b>Growth Management</b>				
Evaluate air pollutant emissions as a factor in determining annual growth allocations.	Adopt a growth management program that allocates permits according to air pollutant emissions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Congestion Management Program Requirements</b>				
Implement the traffic and air pollution reduction measures included in countywide congestion management programs (CMPs).	Require TDM measures as a condition of project approval.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Monitoring Programs</b>				
Include Air District air quality monitoring data in local growth management or other planning reports.	Include data from Bay Area monitors for ozone, carbon monoxide, and PM <sub>10</sub> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitor the effectiveness of project air quality mitigations for local project and program EIRs.	Monitor travel patterns and dust control.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compare the effectiveness of project air quality mitigations with those developed for local congestion management programs and deficiency plans, the Air District's clean air plan, MTC's regional transportation plan, and state TIP.	Monitor vehicle miles traveled, vehicle trips, hours of delay, and transit boardings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitor travel behavior to evaluate effect of transportation-related policies and programs.	Monitor vehicle miles traveled, vehicle trips, hours of delay, and transit boardings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Business Licenses</b>				
Screen new businesses for air pollutant emissions and information related to storage/handling of hazardous materials.	Include in business license permit applications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Dust Control Measure</b>				
Adopt or amend grading ordinance to include thorough dust control provisions.	Sprinkle graded areas with water, install dust screens.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Local Demonstration Programs</b>				
Sponsor joint development of an affordable, high-density housing project near transit facilities/stations.	Work with a non-profit housing group to assemble land and build a project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sponsor a Transportation Demand Management (TDM) contest among local employers.	Award the employer who reduces the most peak-period trips.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sponsor a landscape project using vegetation that screens and shades to reduce energy demand.	Plant appropriate vegetation on model home lots.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## ABOUT THE APPENDICES

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A set of appendices has been developed to supplement this Guidebook. The appendices cover a wide variety of air quality related subjects intended to provide planners with the tools they need to develop effective air quality strategies. For example, to simplify data collection and analysis, Appendix C contains background information about regional air quality, and specific air quality profiles for each of the Bay Area's

nine counties. Other appendices provide site design strategies as well as detailed policy and program ideas. A complete list of appendices follows.

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*Cleaner air is within our reach.  
ABAG and the Air District invite  
you to join us in a partnership  
for clean air.*

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### A – Air Pollutant Sources and Effects

- ▲ Criteria Air Contaminants: carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, particulate matter (inhalable or fine particulates – PM<sub>10</sub>)
- ▲ Toxic Air Contaminants

### B – Air Quality Laws, Programs and Standards

### C – Air Pollutants: Status, Problems and Trends

- ▲ Regional
- ▲ Counties
- ▲ Cities

### D – Climate, Physiography, and Air Pollution Potential

- ▲ Regional: San Francisco Bay Area
- ▲ Subregional Background Conditions: Carquinez Strait Region; Cotati and Petaluma Valleys; Diablo and San Ramon Valleys; Livermore Valley; Marin County Basins; Napa Valley; Northern Alameda and Western Contra Costa Counties Region; Peninsula; Santa Clara Valley; Sonoma Valley; Southwestern Alameda County

### E – Local Planning Strategies

- ▲ Land Use
- ▲ Transportation
- ▲ Other Measures

### F – Design Strategies

- ▲ Community
- ▲ Neighborhood
- ▲ Site-Specific

### G – Local Air Quality Planning Procedures

### H – Benefits/Costs of Local Air Quality Programs

### Glossary of Air Quality Planning Terms

### Bibliography and Resources



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